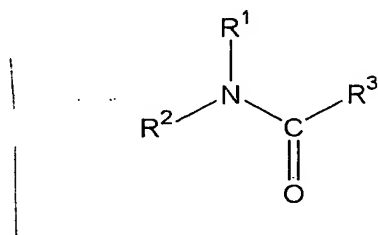


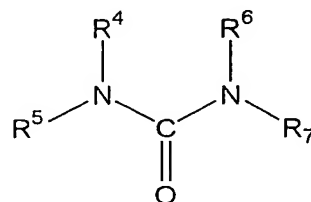
Claims

1. A catalyst for polymerizing α -olefin, comprising a combination of: a component (A) which is a solid catalyst component containing magnesium, titanium, and a halogen as an essential component; a component (B) which is an organoaluminum compound; and a component (C) which is a compound containing a C(=O)N bond.

2. The catalyst for polymerizing α -olefin described in Claim 1, wherein the compound containing a C(=O)N bond of the component (C) is selected from compounds represented by the following general formula [1] or [2]:



[1]



[2]

wherein R^1 to R^7 each represent an aliphatic hydrocarbon group, an alicyclic hydrocarbon group, an aromatic hydrocarbon group, or a hetero atom-containing hydrocarbon group, which have one or more carbon atoms, and the arbitrary groups of R^1 to R^3 and the arbitrary groups of R^4 to R^7 may be combined to form a ring structure.

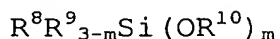
3. The catalyst for polymerizing α -olefin described in Claim 1 or 2, which further comprises in combination a component (D) which is a silicon compound, or a compound having at least two ether bonds.

4. The catalyst for polymerizing α -olefin described in any one

of Claims 1 to 3, wherein the component (A) is obtained by bringing the following component (A1) and component (A2) in contact with each other:

Component (A1): a solid component containing titanium, magnesium, and a halogen as an essential component; and

Component (A2): a silicon compound represented by the following formula:



wherein R^8 represents an aliphatic hydrocarbon group, an alicyclic hydrocarbon group, or a hetero atom-containing hydrocarbon group; R^9 represents an aliphatic hydrocarbon group, an alicyclic hydrocarbon group, a hetero atom-containing hydrocarbon group, a halogen, or hydrogen; R^{10} represents a hydrocarbon group; and m is $1 \leq m \leq 3$.

5. The catalyst for polymerizing α -olefin described in Claim 4, wherein the component (A) is obtained by further bringing the following component (A3) in contact:

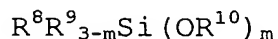
Component (A3): an organoaluminum compound.

6. The catalyst for polymerizing α -olefin described in any one of Claims 1 to 3, wherein the component (A) further comprises a component (E) which is an electron donor.

7. The catalyst for polymerizing α -olefin described in Claim 4 or 5, wherein the component (A1) further comprises a component (E) which is an electron donor.

8. The catalyst for polymerizing α -olefin described in any one

of Claims 3 to 7, wherein the silicon compound of the component (D) is a silicon compound represented by the following formula:



wherein R^8 represents an aliphatic hydrocarbon group, an alicyclic hydrocarbon group, or a hetero atom-containing hydrocarbon group; R^9 represents an aliphatic hydrocarbon group, an alicyclic hydrocarbon group, a hetero atom-containing hydrocarbon group, a halogen, or hydrogen; R^{10} represents a hydrocarbon group; and m is $1 \leq m \leq 3$.

9. The catalyst for polymerizing α -olefin described in any one of Claims 3 to 8, wherein the compound having at least two ether bonds of the component (D) is an aliphatic diether or an aromatic diether.

10. The catalyst for polymerizing α -olefin described in one of Claims 6 to 9, wherein the electron donor of the component (E) is a phthalic acid diester compound, a cellosolve acetate ester compound, a phthalic acid dihalide compound, a succinic acid diester compound, or an aliphatic or an aromatic diether compound.

11. A production method for an α -olefin polymer, which comprises homopolymerizing or copolymerizing α -olefin using a catalyst for polymerizing α -olefin described in any one of Claims 1 to 10.